

Lead In Missouri

Low doses of **lead** can damage the central nervous system of infants and children, causing seizures, disabilities and behavior disorders. In children and adults, **lead** causes fatigue, disturbed sleep and decreased fitness. It damages the kidneys, liver and blood-forming organs. It is suspected of causing high blood pressure and heart disease. High levels damage the nervous system and cause seizures, comas and death. **The National Ambient Air Quality Standards (NAAQS)** are established by the U.S. Environmental Protection Agency (EPA) and limit the amount of certain pollutants allowed in outside air. These limits are based on what is safe for humans to breathe. The **NAAQS** standard for **lead** is set at 1.5 micrograms per cubic meter averaged over a calendar quarter. The federal Clean Air Act Amendments of 1990 require states to bring **nonattainment** areas into compliance with the **lead** standard. **Lead**

emissions are reduced through control strategies and clean work practices. All methods of reducing **lead** emissions are included in the Missouri **State Implementation Plan (SIP)** for **lead**, making them enforceable.

At the beginning of 2000, there were three areas designated as being in **nonattainment** for **lead** standards. The Doe Run Company operates **lead smelters** within these areas. However, on Dec. 18, 2000, the U.S. EPA redesignated the Bixby **lead nonattainment** area to **attainment**.

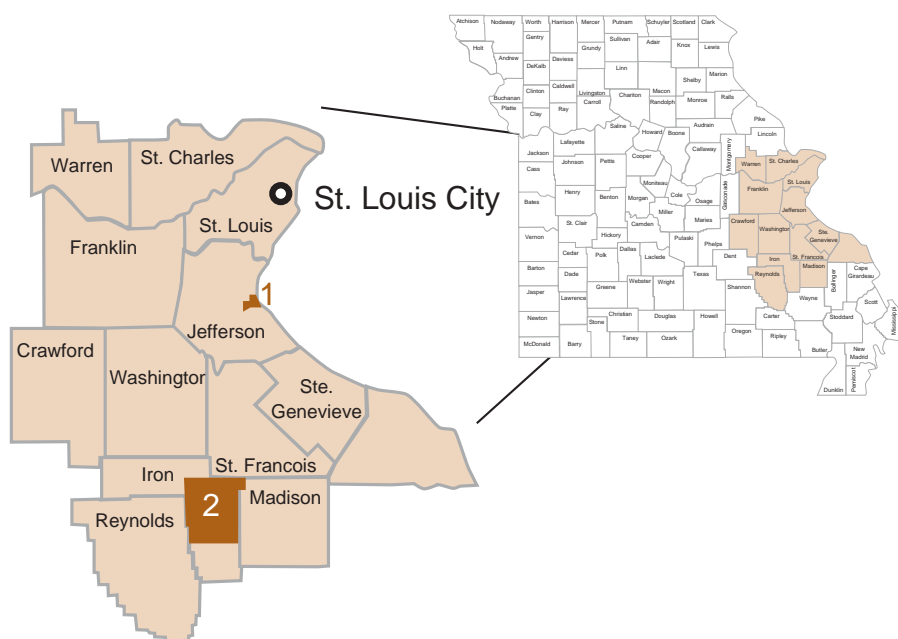
Herculaneum Plan Approval

The Missouri Department of Natural Resources' Air Pollution Control Program recently revised the control strategy for the Herculaneum **lead SIP**. The department's Air Pollution Control Program presented this plan on Oct. 26, 2000. The **Missouri Air Conservation Commission** adopted the plan Dec. 7, 2000.

The **SIP** involved the development of an emission inventory protocol, observation of emission testing, oversight and review of on-site meteorological data, development of a comprehensive hour-by-hour emission inventory, development and considerable refinements of a dispersion model, three rounds of receptor modeling and model reconciliation. The emission control strategy involves enclosure of the main processes at the plant and the installation of building ventilation systems. The ventilation gases will be filtered by high-efficiency filtration systems. Capital costs are expected to be about \$12 million. All controls are expected to be installed by July 31, 2002.

As part of the **SIP** development, the U.S. EPA strongly recommended using a different modeling tool. Chemical Mass Balance modeling is a statistical method of quantifying individual source contributions by exam-

Lead Nonattainment Areas



ining the chemical profile or “finger-print” of each source and comparing this to samples collected in the ambient environment.

Air quality data for the area shows continued violations of the **lead NAAQS**, most notably at the Broad Street monitor. This monitor is located within a few hundred yards of the facility. Preview of the monitoring shows that this monitor gives very high readings on days when the prevailing winds blow directly from the plant to the monitor.

Glover Plan

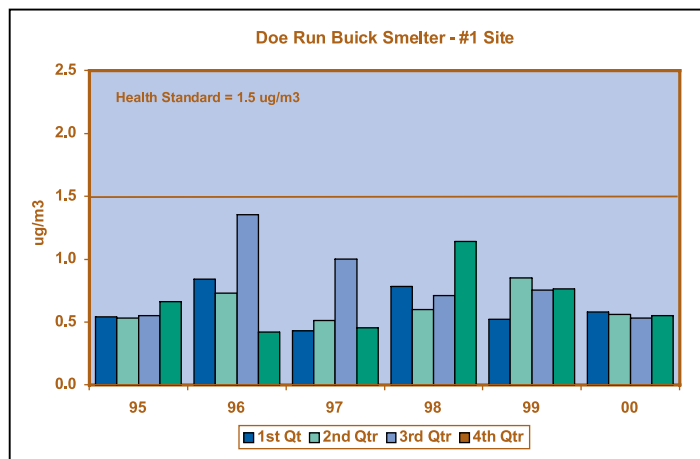
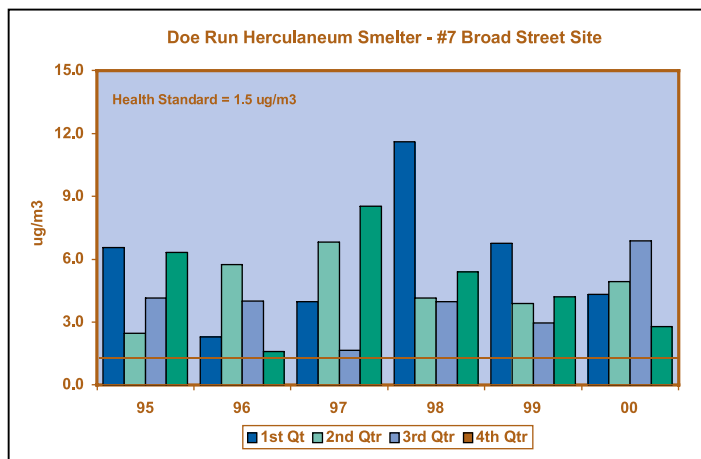
The Doe Run **Smelter** near Glover was formerly known as the ASARCO-Glover **Smelter**. In late August 1998, Doe Run purchased all of ASARCO’s Missouri **lead** interests. In February 1999, the department’s Air Pollution Control Program negotiated an amended consent decree with the Doe Run Company. This comprehensive document specifies

construction schedules, engineering performance criteria, process weight limits, record-keeping requirements, contingency control measures, stipulated penalties and dispute resolution. This action was filed in Iron County Court in August 1999. The new agreement required a formal **SIP** revision. The **Missouri Air Conservation Commission** heard this revision on April 27, 2000, and subsequently adopted it on May 25, 2000. The new consent decree was submitted to the U.S. EPA on July 21, 2000, as an amendment to the **SIP**.

Air monitors near the Doe Run-Glover **Smelter** have not shown a violation of the **NAAQS** since the **SIP** controls were installed Dec. 31, 1996. The department had preliminary meetings with Glover to discuss redesignation of the area to **attainment**. A redesignation request for this area will be developed in 2001.

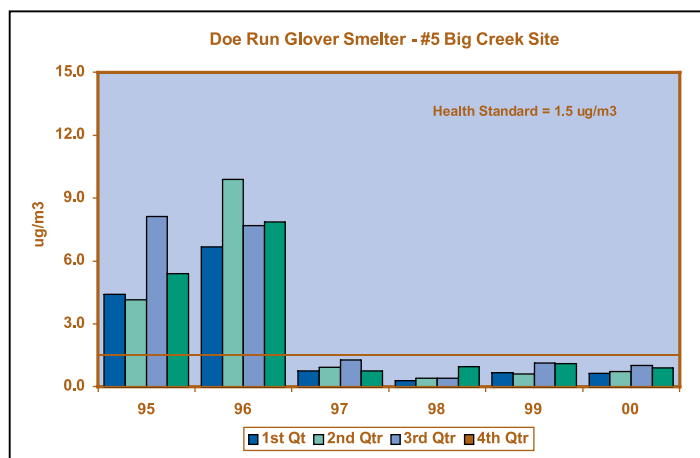
Bixby Redesignation to Attainment

The U.S. EPA announced the redesignation of the **lead nonattainment** area in western Iron County on Dec. 18, 2000. Redesignation means that this area now officially complies with the **NAAQS** for **lead**. The Missouri Department of Natural Resources submitted a plan for maintaining compliance with the **lead** standard to the U.S. EPA May 12, 2000. The maintenance plan outlined steps to ensure permanent and enforceable emission reductions at the Doe Run Resource Recycling Facility near Bixby. The plan submitted by the state also requires operation of a monitoring network and adherence to a manual of best work practices. Finally, the plan includes a commitment by the state to submit a revised maintenance plan eight years after the redesignation date. That revised plan must demonstrate that the area will remain in compliance with the **lead** standard for another 10 years.



Average Quarterly Concentrations of Lead in Ambient Air Near Lead Smelters in Missouri

Since Missouri is the chief **lead**-mining district in the nation, with several **smelters**, the department conducts ambient monitoring for **lead**. Developed by the U.S. EPA, the health standard for **lead** defines the maximum safe level for human exposure to this otherwise useful metal. The **National Ambient Air Quality Standard (NAAQS)** for **lead** is 1.5 micrograms per cubic meter, averaged from all the monitor filters collected in one-quarter of the year. Currently, the Herculeaneum **smelter** is the only one registering **exceedances** of the airborne standard.



Fine Particulate Matter

PM_{2.5} is primarily generated from combustion sources. It can be emitted directly as particulate, or it can be formed from gases that are emitted, which combine or condense in the atmosphere to make particles. Sulfur or nitrogen compounds are likely to be significant in different areas of the country. In addition to the ambient monitoring currently being conducted, the department plans in the future to conduct sampling that could be analyzed for specific compounds or species of compounds. This would help determine what types of sources

are most responsible for **PM_{2.5}** levels in different parts of the state.

The time schedule for the **PM_{2.5}** standard to be implemented and attained will take several years because a new monitoring system for this type of pollution must be created. Based on U.S. EPA guidance, Missouri has designed a network of 30 monitors. By the end of 1999, 20 monitoring sites were in operation. The U.S. EPA will designate area **attainment** by 2003 based on three years of gathered data beginning in 2000.

1999 - 2000 PM_{2.5} Data Summary

24-Hr Std = 65 ug/m³, 98th Percentile

Annual Mean Std = 15.0 ug/m³

Site Name	Maximum Values		Annual Mean		Mean 99/00
	1999	2000	1999	2000	
West Alton	43.7	35.2	14.4	14.9	14.6
Margaretta	49.4	41.8	15.3	14.9	15.1
Blair Street	64.5	45.2	17.3	16.3	16.8
South Broadway		42.3		15.8	15.8
Second and Mound	29.0	43.3		15.7	15.7
Florissant Valley	46.9	37.7	14.6	14.3	14.5
Clayton	46.7	51.0	15.2	15.1	15.2
Arnold	46.5	34.8	15.2	14.7	15.0
Liberty	28.9	32.8	11.2	11.0	11.1
North Kansas City	37.3	39.5	12.2	13.1	12.7
Sugar Creek	36.2	37.3	11.8	12.6	12.2
Locust	34.9	41.9	14.0	14.4	14.2
Richards Gebaur-S	30.1	40.9	11.6	11.8	11.7
4928 Main Street		40.4		12.7	12.7
Eldorado Springs	31.2	37.3	11.3	11.5	11.4
Mark Twain State Park	38.9	34.5	11.1	11.0	11.1
Ste. Genevieve	42.1	37.0	13.8	15.2	14.5
SW MO State University	35.0	42.7	12.2	12.3	12.3
Mountain View	50.2	37.2	13.0	13.4	13.2
St. Joseph	30.8	31.9	12.5	11.8	12.2
Carthage Stone	37.7	31.3	13.1	13.2	13.2

units = micrograms per cubic meter